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ABSTRACT

This document discusses the uses of educational communications technology in the state of Wisconsin. The report is divided into five parts. Part 1 describes the state and local educational organizational structure in Wisconsin, including the numbers of each type of institution and the students enrolled in their courses or programs. Part 2 examines specific communications technologies available to educational institutions, such as fiber optics, instructional television, satellites, telephones, magnetic media, CD-ROM, and the Internet. Part 3 provides examples of uses of existing communications technologies as well as planned applications. Part 4 discusses recent state legislation relating to the regulation of telecommunications utilities, including planning for the deployment of new high capacity telecommunications equipment and services to educational institutions and grants for telecommunications projects. Part 5 identifies certain federal funds which are available for educational communications technology projects as well as three bills pending before the U.S. Congress relating to the regulation of the telecommunications industry. (AEF)

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EDUCATIONAL COMMUNICATIONS TECHNOLOGY AND ITS USES IN WISCONSIN

Staff Brief 94-5

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Joint Legislative Council *Madison, Wisconsin*

Special Committee on Educational Communications Technology *September 14, 1994*

Staff Brief 94-5*

EDUCATIONAL COMMUNICATIONS TECHNOLOGY AND ITS USES IN WISCONSIN

INTRODUCTION

This Staff Brief was prepared for the Legislative Council's Special Committee on Educational Communications Technology. The Special Committee was established by a June 22, 1994 mail ballot and directed to:

> [S]tudy the current and potential use of communications technology for educational purposes within the higher education institutions, public and private schools, vocational, technical and adult education schools and private proprietary schools of this state, including access to equipment and services, cooperative ventures, programming and funding, to ensure that the educational opportunities and capabilities presented by communications technology are fully exploited.

This Staff Brief describes: (1) the organizational structure for education in Wisconsin, including the numbers of each type of institution and the students enrolled in their courses or programs; (2) communications technologies available to educational institutions in Wisconsin; (3) examples of uses of communications technologies by educational institutions in Wisconsin; (4) recent state legislation relating to the regulation of telecommunications utilities, including planning for the deployment of new high capacity telecommunications equipment and services to educational institutions and grants for educational telecommunications projects; and (5) certain federal funds available for educational communications technology projects and three bills pending before the U.S. Congress relating to regulation of the telecommunications industry.

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* This Staff Brief was prepared by Jane R. Henkel, Deputy Director, and Bob Conlin, Staff Attorney, Legislative Council Staff.

PART I

STATE AND LOCAL EDUCATIONAL STRUCTURE

This Part of the Staff Brief summarizes the legal structure for educational and related institutions in Wisconsin, including public and other libraries. This summary specifically describes those persons or bodies who, based on their current responsibilities, appear to be the persons or bodies who would be involved in making policies or decisions affecting the use of educational communications technology.

This Part also provides information on the numbers of each of the different types of educational institutions in the state and the numbers of students enrolled in those institutions or in courses or other educational programs offered by those institutions.

A. PUBLIC ELEMENTARY AND SECONDARY EDUCATION

1. State Superintendent of Public Instruction and the Department of Public Instruction

State-level responsibility for public elementary and secondary education in Wisconsin is primarily vested in the State Superintendent of Public Instruction, who is a nonpartisan, elected state official, and the Department of Public Instruction (DPI), which is headed by the State Superintendent.

The State Superintendent and the DPI are charged with the general supervision of the public elementary and secondary schools in the state. The DPI provides a broad range of technical assistance to school districts, audits school districts' compliance with state standards and requirements and administers state and federal aids to school districts [chs. 115 to 121, Stats., as affected by the Acts of 1993].

The DPI's activities related to educational communications technology are carried out primarily in its Division for Libraries and Community Learning. As described under Section I, 3, below, the statutes assign primary state-level responsibility for public libraries in the state to the State Superintendent of Public Instruction and the Division for Libraries and Community Learning.

Council on Instructional Telecommunications

Under current law, the State Superintendent is required to appoint a Council on Instructional Telecommunications composed of one member representing each cooperative educational service agency (CESA), described under item 3, below, from nominations made by the boards of control of the CESA's, and two members representing private primary and secondary educational institutions [s. 15.377 (3), Stats.].

The Council advises the State Superintendent and the Educational Communications Board (ECB) on matters related to educational telecommunications.

When the Council was originally created, in 1985, the membership of ECB was amended to include the Chairperson of the Council along with the Chairpersons of the Council on Public Television and the Council on Public Radio, described in Section G, 2, below [s. 15.57 (6), Stats., as created by 1985 Wisconsin Act 29]. In 1991, however, the membership of the ECB was amended to remove the Chairperson of the Council on Instructional Communications from the ECB [1991 Wisconsin Act 39].

2. Public School Districts

a. School Boards

Locally elected school boards exercise general supervision over the schools of each school district, are responsible for the possession, care, control and management of the property and affairs of the school district and determine the district's tax levy [ss. 120.12 and 120.13, Stats., as affected by the Acts of 1993].

Alternatives that a school board could consider relating to the purchase or use of educational communications technology include contracting with a CESA, as described under item 3, below, or contracting with other governmental entities under s. 66.30, Stats., as described under Section J, below.

b. Numbers of Public School Districts and Schools and Their Enrollments

In the 1993-94 school year:

There were ***427 public school districts*** in Wisconsin:

- 370 school districts operating grades prekindergarten (PK) through 12.
- 10 school districts operating only high school grades (grades 9 through 12).
- 47 school districts operating grades PK through 8.

There were ***2,034 schools*** in those districts:

- 1,251 elementary schools (grades PK through 8).
- 263 middle schools (grades 5 through 8).
- 4 combined elementary and secondary schools.
- 81 junior high schools (grades 7 through 9).

- 435 high schools (grades 9 through 12).

Total ***enrollment*** (head count) in the 427 public school districts was ***844,001 pupils***:

- 595,717 pupils in grades PK through 8.
- 248,284 pupils in grades 9 through 12.

Source: Wisconsin DPI, *Basic Facts About Wisconsin Elementary and Secondary Schools 1993-94*, pp. 2 to 4.

3. Cooperative Educational Service Agencies

The territory of the state is divided into 12 CESA's. All school districts in the state must be in one of the 12 CESA's, except that school districts in CESA 1 may withdraw from that CESA. To date, the Kenosha and Racine School Districts have withdrawn from CESA 1 [s. 116.065, Stats.].

Each CESA is governed by a board of control composed of not more than 11 members of the school boards of the school districts within the CESA. A CESA administrator, appointed by the board of control, is responsible for coordinating and administering the services provided by the CESA to school districts and securing the participation of school districts in those services [ss. 116.02 to 116.04, Stats., as affected by 1993 Wisconsin Act 355].

The purpose of CESA's is, in part, "to serve educational needs in all areas of Wisconsin by serving as a link both between school districts and between school districts and the state." CESA's may provide leadership and coordination services for school districts, including the following services:

a. School district management development.

b. Coordination of vocational education and exceptional education.

c. Research.

d. Special student classes.

e. Human growth and development.

f. Data collection, processing and dissemination.

g. In-service programs [s. 116.01, Stats.].

Often, the programs or services offered by CESA's cannot economically or efficiently be provided by a single school district but can be economically and efficiently provided if a number of school districts share the service. Each CESA provides the services that school districts

within that CESA identify as priority needs. Not all school districts served by a CESA participate in all of the services offered by the CESA; each school district contracts with the CESA for only those services it wishes to receive. A CESA may also contract to provide services to school districts outside the boundaries of a CESA and with counties or other CESA's subject to certain limitations [s. 116.03 (3), Stats.].

If a CESA enters into a service contract to provide telecommunications services, it must report to the ECB the terms and conditions of the contract [s. 116.03 (3), Stats.].

B. PRIVATE ELEMENTARY AND SECONDARY EDUCATION

1. Private Schools

The organizational structure for private elementary and secondary schools operating in Wisconsin is not governed by the Wisconsin statutes; generally, such schools have a governing body which makes the major decisions related to its schools.

In the 1993-94 school year, there were ***949 private schools*** in Wisconsin with a total enrollment (head count) of ***149,782 pupils***: 124,889 pupils in grades PK through 8 and 24,893 pupils in grades 9 through 12.

Source: Wisconsin DPI, *Basic Facts About Wisconsin Elementary and Secondary Schools 1993-94*, pp. 2 and 4.

2. Home-Based Private Educational Programs

Under the Wisconsin statutes, instruction in a home-based private educational program that meets certain criteria may be substituted for attendance at a public or private school [s. 118.15 (4), Stats.].

A "home-based private educational program" means a program of educational instruction provided to a child by the child's parent or guardian or by a person designated by the parent or guardian. An instructional program provided to more than one family unit does not constitute a home-based private educational program [s 115.001 (3g), Stats.].

In the 1993-94 school year, there were ***6,355 home-based private educational programs*** in Wisconsin attended by ***11,482 children***.

Source: Information provided by DPI staff.

C. TECHNICAL COLLEGE SYSTEM

1. Governance

The governance of the Wisconsin Technical College System (TCS) is shared by the State TCS Board, the boards of ***16 individual TCS districts*** and the students.

a. State Board

The State TCS Board consists of 13 members: one employer representative, one employe representative, one farmer representative, six public members and one student, all of whom are nominated by the Governor and with the advice and consent of the State Senate appointed; and three ex-officio members [the State Superintendent of Public Instruction, the Secretary of Industry, Labor and Human Relations and the President of the University of Wisconsin (UW) System Board of Regents] [s. 15.94, Stats., as amended by 1993 Wisconsin Act 399].

The State TCS Board is responsible for overall planning for vocational, technical and adult education. Other responsibilities of the Board include approving the qualifications of educational personnel and the courses of study offered in the district schools; distributing grants and state aid to districts; approving district board proposals for land acquisition, new facilities, rentals and remodeling; and establishing uniform program fees and materials fees for students [ch. 38, Stats., as affected by the Acts of 1993].

b. District Boards

Each of the 16 TCS districts is governed by a nine-member district board which includes two employers, two employes, three public members, a school district administrator and an elected official who holds a state or local office. Board membership must also be representative of the general population distribution within the district, the distribution of women and minorities within the district and, for Milwaukee, the distribution of minorities within the City of Milwaukee. Appointments to the district boards are made by local committees which consist of county board chairs in 13 districts and school board presidents in the other three districts (Milwaukee, Southwest and Fox Valley) [ss. 38.08 and 38.10, Stats.].

The district board has general supervision and control of the district schools and their operations and determines the district's budget and tax levy. Other powers and duties of district boards include developing courses, with State TCS Board approval; purchasing or leasing materials, supplies, equipment, buildings and land; and constructing, enlarging or improving buildings [ch. 38, Stats., as affected by the Acts of 1993].

A district board may also enter into contracts to provide educational services to public and private educational institutions, federal and state agencies, local governmental bodies, industries and businesses; enter into contracts with local community-based organizations for basic skills instruction; contract to provide fiscal and management services to public and private

educational institutions, federal and state agencies and local governmental units; and contract with a foreign government or any business which is not operating in this state if the district will receive a direct and measurable benefit from the contract [s. 38.14 (3), Stats.].

Also, see the description of public radio and pubic television under Section H, below.

c. Students

The students of each district are "active participants" in the immediate governance of and policy development for the district; may participate in all matters affecting student interests to the extent not in conflict with the terms of any collective bargaining agreement; have primary responsibility for the formulation and review of policies concerning student life and services; and, in consultation with the district director and subject to confirmation by the district board, have responsibility for the disposition of student activity and incidental fees [s. 38.145, as created by 1993 Wisconsin Act 101].

2. Number of Campuses and Enrollments

The 16 TCS districts have ***16 main and 30 satellite campuses***. In 1992-93, the technical colleges served a total of ***452,897*** students in post-secondary (college parallel, associate degree and vocational) and continuing education (vocational-adult and district/community services) programs.

Source: Information provided by State TCS Board staff.

D. UNIVERSITY OF WISCONSIN SYSTEM

1. Governance

The governance of the UW System is shared by the Board of Regents, the UW System and campus administrations, the faculty, the academic staff and the students.

a. Board of Regents

The Board of Regents consists of 17 members: 14 public members and one student member who are nominated by the Governor and with the advice and consent of the State Senate appointed; and two ex-officio members (the State Superintendent of Public Instruction and the President of the State TCS or their designees) [ss. 15.07 (1) and 15.91, Stats.].

Responsibilities of the Board include establishing polices and rules for governing the UW System; planning for the future needs of the state for university education; setting admission standards and policies; allocating funds and adopting budgets for the institutions; establishing tuition and fees; and establishing a mission statement for each institution [ss. 36.09 (1) and 36.27, Stats.].

b. President and Chancellors

The President and chancellors of the UW System are appointed by the Board of Regents. The ***President*** is responsible for administering the UW System under Board policies and directing a central administration to assist the Board and the President [s. 36.09 (2), Stats.].

The ***chancellors*** are the executive heads of their respective faculties and institutions. There is a chancellor for each university in the UW System, for the UW Centers and for the UW-Extension. Subject to the Board of Regents' policies, the chancellors in consultation with their faculties are responsible for designing curricula and setting degree requirements; determining academic standards and establishing grading systems; defining and administering institutional standards for faculty peer evaluation and screening candidates for appointment, promotion and tenure; recommending individual merit increases; administering auxiliary services; and administering funds generated or used by their institutions [s. 36.09 (3), Stats.].

c. Faculty

The faculty of each institution, subject to the responsibilities and powers of the Board, the President and the chancellor of the institution, are "vested with responsibility for the immediate governance of such institution and shall actively participate in institutional policy development." The faculty has primary responsibility for academic and educational activities and faculty personnel matters [s. 36.09 (4), Stats.]

d. Academic Staff

The academic staff members at each institution, subject to the responsibilities and powers of the Board, the President and the chancellor and faculty at that institution "shall be active participants in the immediate governance of and policy development for the institution." Academic staff members have the primary responsibility for the formulation and review of all policies and procedures concerning academic staff members, including academic staff personnel matters [s. 36.09 (4m), Stats.].

e. Students

The students of each institution or campus are active participants in the immediate governance of and policy development for such institution; have primary responsibility for the formulation and review of policies concerning student life, services and interests; and, in consultation with the chancellor of their institution and subject to confirmation by the Board, have responsibility for the disposition of those student fees which constitute substantial support for campus student activities [s. 36.09 (5), Stats.].

2. Institutions and Enrollments

The institutions that comprise the UW System are ***11 comprehensive (four year)*** universities; ***two doctoral*** universities; ***13 two-year*** centers; and the ***UW-Extension*** which has offices in all of Wisconsin's 72 counties.

In the Fall 1993 term, the 13 universities and 13 centers had a total enrollment (head count) of ***154,620 students***, as follows:

- 64,206 in the two doctoral universities;
- 79,569 in the 11 comprehensive universities; and
- 10,845 in the 13 centers.

Source: *The University of Wisconsin System Student Statistics, Fall 1993*, p. 1.

3. UW-Extension

In the 1992-93 school year, the UW-Extension had enrollments, audience counts, clients and contacts as follows:

- 260,682 enrollees in its continuing education programs;
- 2,750 clients in its adult educational counseling programs;
- 2,144 counseling clients in its Small Business Development Center;
- 29,988 enrollees in its credit outreach program;
- 11,908 enrollees in its independent studies programs; and
- 1,182,603 contacts in its cooperative education extension programs (individuals who participate in more than one program are counted more than once in this total).

The UW-Extension has over 30,000 enrollees in its teleconferencing programs (these enrollees are included in the above counts for continuing education programs, credit outreach programs and cooperative education extension programs). [See the discussion of the Educational Teleconference Network (ETN), WisLine and WisView in Part III, A, 2, 3 and 6, of this Staff Brief.]

Within the UW System, the principal responsibility for broadcasting is assigned to the UW-Extension. See the description of public radio and pubic television under Section H, below.

Source: *The University of Wisconsin System 1994-95 Fact Book*, p. 36.

4. Learning and Information Technology: Office, Council and Related Groups

The UW System's Office of Learning and Information Technology (OLIT) is "the primary advisor and advocate to" the President of the UW System, the Senior Vice Presidents for Academic Affairs and Administration and other UW System Administration personnel on learning and information technologies and provides general leadership relating to systemwide and intercampus learning and information technology.

The President of the UW System is to appoint the systemwide Learning and Information Technologies Executive Council to assist the OLIT in reviewing systemwide learning and information technology policies, plans and standards and making recommendations to the President and the Senior Vice Presidents. The Council will make recommendations related to systemwide strategic planning and intercampus technical compatibility standards and advise UW System Administration on learning and information technology and related initiatives. The Council will consist of the Associate Vice President of Learning and Information Technology; two Vice Chancellors; representatives of campus constituencies, such as the campus computing directors, library directors, distance education coordinators, student affairs officers, business representatives and faculty; representatives of the UW System Administration departments responsible for budget planning, the capital budget and architectural and engineering services; and three additional members. Also, the ECB, DPI, TCS and Department of Administration (DOA) will be invited to appoint ex-officio members.

Source: *UW System General Administrative Policy Paper (GAPP)*, No. 42.

E. PRIVATE, NONPROFIT COLLEGES AND UNIVERSITIES

1. Organization

Typically, private, nonprofit colleges and universities are nonprofit corporations which are governed by a policy-making body called a board of trustees or a board of regents.

2. Numbers of Colleges and Students

In the 1993-94 school year, there were ***21 four-year private, nonprofit colleges and universities*** in the Wisconsin Association of Independent Colleges and Universities with a total enrollment of ***44,821 students***. In addition, there are three four-year private, nonprofit colleges and one two-year private nonprofit college in the state which do not belong to the Wisconsin Association of Independent Colleges and Universities.

Source: Information provided by the Wisconsin Association of Independent Colleges and Universities.

F. PROPRIETARY SCHOOLS

1. Regulation and Organization

Generally, proprietary schools (private schools operated for profit) offering instruction leading to a vocational objective to residents of the state must be examined and approved by the Educational Approval Board (EAB) before operating in the state [s. 38.51 (9) and (10), Stats.]. The EAB, which is attached to the State TCS Board for administrative purposes only, consists of not more than seven members who must be representative of state agencies and other persons with a demonstrated interest in educational programs [s. 15.945 (1), Stats., as affected by the Acts of 1993].

The organizational structure for a proprietary school operating in the state is not governed by the Wisconsin statutes and may range from a sole proprietorship to a corporation with a board of directors.

2. Numbers of Schools and Students

There are ***75 approved proprietary schools*** in Wisconsin. [As of February 1994, there were 72 approved and operating proprietary schools in Wisconsin and three schools which had been approved by the EAB but had not yet begun operations. According to EAB staff, presumably, those three schools are now operating.] The EAB staff estimates that there are approximately ***10,000 to 14,000 students*** attending proprietary schools approved by the EAB at any given time. The EAB will be conducting a survey of proprietary schools in the near future which will provide more accurate information on the number of students attending these schools.

Source: Information provided by the EAB staff.

G. EDUCATIONAL COMMUNICATIONS BOARD

1. The Board

The ECB consists of 16 members: one representative of public schools, one representative of private schools and two public members, who are nominated by the Governor and with the advice and consent of the State Senate appointed; four Legislators, who are appointed as are members of standing committees of the Legislature; one member appointed by the Board of Regents of the UW System; one member appointed by the State TCS Board; and six ex-officio members (the Secretary of Administration, the State Superintendent of Public Instruction, the President of the UW System, the Director of the State TCS Board or their designees and the chairpersons of the Council on Public Radio and the Council on Public Television) [ss. 15.05 (1) (a) and 15.57, Stats., as affected by 1993 Wisconsin Act 399].

The ECB was created in 1971 to develop and operate state radio and television broadcast systems for educational purposes. As advances in telecommunications technology occurred, the

ECB assumed additional responsibilities in two areas: public broadcasting and distance education. Its role in distance education is now recognized in the statutes by requirements that the ECB: (a) provide leadership in securing appropriate funding for regional educational telecommunications networks maintained by schools and other educational institutions; (b) coordinate the development of the networks; and (c) establish technical standards for the networks and their interconnections [s. 39.11 (20), Stats., created by 1991 Wisconsin Act 269].

Other duties of the ECB include:

a. Planning, developing and constructing a state radio and television public broadcasting system for the presentation of educational, informational and public service programs.

b. Reviewing, advising, coordinating and evaluating the joint efforts of educational agencies and institutions of the state in the area of educational radio and television.

c. Acting as a central clearinghouse and source of information concerning educational radio and television activities in the state.

d. Coordinating the radio activities of the various educational and informational agencies, civic groups and citizens.

e. Providing leadership in securing adequate funding for statewide joint use of radio and television for educational and cultural purposes.

f. Establishing and operating an interconnection between the broadcast facilities and higher education campuses to facilitate statewide use of closed circuit and broadcast radio and television for educational purposes; cooperating with similar bodies in other states; and participating in regional and national network planning.

g. Assisting any state agency, upon its request, in the development and review of plans for the utilization of educational radio and television.

h. When appropriate and related to the programs of the state educational radio and television network, procuring or publishing instructional material.

i. Receiving and disbursing state, federal and private funds [s. 39.11, Stats.].

2. Public Radio and Television Councils

The ECB has two statutorily created advisory councils which are appointed by the Governor: the Council on Public Radio and the Council on Public Television. The Council on Public Radio consists of members of the Board of the Wisconsin Public Radio Association. The Council on Public Television consists of five members appointed for four-year terms from recommendations made by local television support groups [ss. 15.09 (1) (a) and 15.577, Stats.].

The duties of these Councils are not specified in the statutes, but the chairpersons of these Councils serve on the ECB [s. 15.57 (6), Stats.].

Also, see the description of public radio and pubic television under Section H, below.

3. Distance Education Technologies Initiative Committee

The Distance Education Technologies Initiative Committee (DETIC) was created by the ECB. Members of DETIC are appointed by the ECB's Executive Director and include representatives from CESA's, the DOA, the DPI, the UW System, the Wisconsin Association of Independent Colleges and Universities, the TCS and the ECB.

The purpose of the DETIC is to advise the ECB on matters related to:

a. Coordinating the development of distance education networks.

b. Establishing standards for those networks and their interconnections.

c. Providing leadership in securing appropriate funding for regional and statewide educational telecommunications networks maintained by schools and other educational institutions.

d. Facilitating collaboration and the sharing of information to meet the distance education needs of the state.

The DETIC has been directed to:

a. Work with interested constituencies.

b. Identify and disseminate regulatory, technical and policy information to agencies.

c. Propose and help implement appropriate actions to develop, fund and use telecommunications technologies to achieve equal access to education for all the residents of the state.

d. Employ continuous improvement strategies and techniques in carrying out its activities.

Source: *Distance Education Technologies Initiative Committee (DETIC),* an undated description prepared by ECB staff.

H. PUBLIC RADIO AND PUBLIC TELEVISION

State-level responsibility for Wisconsin public broadcasting is shared by the ECB and UW-Extension. Through a formal written agreement, the two agencies operate the statewide services of Wisconsin Public Radio and Wisconsin Public Television. Other entities also hold

public television and radio licenses and participate in Wisconsin Public Radio. [As noted below, neither Wisconsin Public Radio nor Wisconsin Public Television is a legal entity.]

1. Public Radio

The following entities in the state hold a total of 42 public radio licenses:

ECB:	10 licenses
UW Board of Regents:	12 licenses*
Gateway Technical College:	1 license
School districts:	4 licenses
Private colleges and schools:	7 licenses
Community groups:	3 licenses
Other:	5 licenses

*Seven of the 12 UW Board of Regents' stations are campus stations. In general, these stations do not have full-time professional staff and their primary budget support is from institutional allocations and segregated student fees.

All of the ECB stations, six of the UW stations, the Gateway Technical College station, a station operated by the Milwaukee Public Schools and the three community stations are qualified to receive funding from the Corporation for Public Broadcasting (CPB), a nonprofit corporation which receives funds from the U.S. Congress in support of public radio and television broadcasting nationwide.

Seventeen of the public radio stations have formed an association, called Wisconsin Public Radio, to facilitate common programming. Wisconsin Public Radio is not a legal entity.

2. Public Television

Three entities in the state currently hold public television licenses. They are as follows:

ECB:	5 licenses
UW Board of Regents:	1 license
Milwaukee Area Technical College:	2 licenses

The five stations licensed to the ECB are primarily transmitting facilities with the minimum of staff necessary to receive the network signal via microwave and broadcast it locally. The three other stations have production capabilities. All of these stations are qualified to receive funding from the CPB.

Statewide coverage is achieved through affiliation agreements between the ECB, the Board of Regents and the Milwaukee Area Technical College. Additional coverage is provided by an affiliation agreement with WDSE-TV in Duluth, Minnesota.

The public television stations provide general audience programming, such as Masterpiece Theatre and Nova, during the evening and all day on weekends. Monday through Friday, all of the stations carry eight hours of primary and secondary school programs. Fourteen hours of adult education programs are also provided throughout the week.

The activities of the six ECB and UW Board of Regents' television stations have been consolidated to create a single identity for the state's general audience programming service, called Wisconsin Public Television. Wisconsin Public Television is not a legal entity and, generally, does not support instructional programming.

Source: Wisconsin Legislative Fiscal Bureau, Informational Paper #40, *Public Broadcasting and Distance Education*, January, 1993; and Wisconsin Legislative Audit Bureau, *An Evaluation of Educational Communications Board*, January, 1991.

I. LIBRARY SERVICES

1. Libraries

Library services in Wisconsin are provided through municipal libraries and a wide range of other public and private agencies including schools, universities, private businesses and state agencies. Most local public library services in Wisconsin are provided by municipal libraries (a library operated by a single city, village, town, tribal government or a school district which operated a public library facility prior to December 17, 1971). Municipal libraries are governed by local library boards and receive funding from municipal governments. There is also a small number of joint municipal and joint city-county libraries. Where there is no municipal, joint municipal or joint city-county library, the county provides library services or contracts for such services [ss. 43.52 to 43.60, Stats.].

There are ***380 municipal and county library service organizations in Wisconsin***: ***six*** consolidated county libraries where the county library provides all public library services; ***three*** joint city-county libraries; ***28*** joint municipal (some combination of city, village and town) libraries; ***335*** libraries operated by a single municipality; and ***eight*** county library services which contract for access to public libraries for county residents who live outside the jurisdiction of a municipal library.

The *1992 Wisconsin Library Service Record,* published by the DPI, lists ***78 academic libraries*** (counting each institution, such as UW-Madison, once) and more than ***450 special libraries*** (libraries with collections on special topics such as the library maintained by Integrated Paper Services, Inc., which contains materials on pulp, paper and allied industries, the Sauk County Historical Society's library which has local, county, state and national history material and numerous medical and law collections).

Source: Wisconsin DPI, *1992 Wisconsin Library Service Record*; and additional information provided by DPI staff.

2. Public Library Systems

Public library systems were created in 1971 to improve library services, promote resource sharing among libraries and increase access to library materials and services by the state's residents. Public library systems may be organized on a single-county or multiple-county basis. The territory within each system must contain a city with a population of at least 30,000 and have a total population of at least 85,000. Each system must have at least one system resource library [ss. 43.15 (1) and 43.16, Stats.].

A single-county library system can be organized as a federated public library system or a consolidated public library system. Under a federated system, each included county and the governing bodies of the municipalities maintaining libraries participating in the system enter into written agreements with the system to participate in the system, to participate in an interlibrary loan with other system libraries and to allow any resident of the system area the same library services, on the same terms, as provided to residents of the county or municipality that established the library. The governing boards of federated systems are named by the county boards involved [ss. 43.15 (4) and 43.19, Stats.].

Under a consolidated system, public library service in a county is administered by a single library board, appointed by the county board. A consolidated system may consist of only a single county [ss. 43.15 (4) (d) and 43.21, Stats.].

Currently, there are 17 public library systems in the state and all territory of the state is included in a system. Currently, all of the public library systems are organized on a federated basis; there are no consolidated public library systems.

The standards that public library systems must meet to qualify for state aid emphasize resource sharing, cooperation and access to library resources by all residents of the system. The standards include the following:

a. Interlibrary loan among all participating public libraries.

b. Backup reference and interlibrary loan services from the system resource library.

c. Access by any resident of the system area to the library services of any participating library on the same terms as provided to local residents.

d. Referral or routing of reference and interlibrary loan requests from libraries within and outside the system.

e. In-service training for participating public library personnel.

f. Regular delivery and communications systems for participating libraries.

g. Service agreements with all adjacent public library systems.

h. Professional consultant services to participating public libraries and counties.

i. Cooperation and continuous planning with other types of libraries (such as academic and special libraries) in the system area.

j. Continuous planning regarding developing the library materials collection, providing services to users with special needs, appropriate sharing of library resources and improving automation and technical services [s. 43.24 (2), Stats.].

3. Division for Libraries and Community Learning

The statutes identify the State Superintendent of Public Instruction and the Division for Libraries and Community Learning in the DPI as the state official and the state agency with primary responsibilities for public libraries in the state. The Division is assigned responsibilities for recommending standards for school, public and institutional libraries in the state; providing assistance to school libraries, public libraries, public library systems and institutional libraries throughout the state; establishing standards for and certifying public librarians; and coordinating and conducting continuing education programs for librarians. In addition, the Division is directed to maintain a reference and loan library to supplement the collections of all types of libraries in the state [see ch. 43, Stats.].

4. Council on Library and Network Development

The Council on Library and Network Development consists of 15 members appointed by the State Superintendent of Public Instruction. Seven of the members must be library science, audiovisual and information science professionals representing different types of libraries and information services and eight must be public members with demonstrated interest in libraries or other types of information services [s. 15.377 (6), Stats.].

The State Superintendent and the Division for Libraries and Community Learning must seek the advise of and consult with the Council in performing their duties relating to library service. In addition, the Council must:

a. Make recommendations to the Division regarding the development of standards for the certification of public librarians and standards for public library systems.

b. Advise the State Superintendent regarding the state's policies and activities relating to library development, interlibrary cooperation, network development and school library media programs, including the coordination of school library media programs with other library services [s. 43.07, Stats.].

J. INTERGOVERNMENTAL [SECTION 66.30] AGREEMENTS

Under s. 66.30, Stats., any "municipality" may contract with another municipality for the receipt or furnishing of services or the joint exercise of any power or duty required or authorized by law.

For the purposes of this authorization, a "municipality" is defined as the state or any of its departments or agencies, or any school district, city, village, town, county, public library system, public inland lake protection and rehabilitation district, sanitary district, farm drainage district, metropolitan sewerage or planning commission. If the municipal parties to such a contract have varying powers or duties, each party to the contract may act under the contract to the extent of its lawful powers and duties.

These intergovernmental agreements may be used, as appropriate, for the purchase or use of educational communications.

PART II

COMMUNICATIONS TECHNOLOGIES

A number of communications technologies may be employed to provide educational opportunities to schools and other educational institutions. Those technologies include telecommunications technologies, such as fiber optics, microwave, satellite, telephone and television, as well as other communications delivery systems such as CD Rom and videotape. This Part of the Staff Brief describes a number of the communications technologies available to educational institutions in Wisconsin. Except where otherwise specifically noted, the source for the following discussion of communications technologies is the 1993 study conducted for the ECB by Evans Associates and reported in *Wisconsin Distance Education Technology Study: 1993.*

A. FIBER OPTICS

Fiber optic technology uses fiber strands made of pure silicon glass to transmit light waves capable of carrying voice, video and data transmissions. The fiber strands are usually bound in cables which include some form of steel reinforcement to strengthen and protect the package of fragile fibers. The current estimated average useful life of fiber optic cables is approximately 20 to 30 years.

Fiber optics offers its users several important features. First, as noted above, fiber optics may carry voice, video and data transmissions. Second, fiber optics is lighter and has greater transmission capacity than traditional communications technologies such as standard telephone lines or coaxial cable (described in Section F, below), which use copper wires. For example, a single fiber optic line consisting of two glass fibers can carry roughly 25,000 two-way conversations at the same time, whereas a pair of fiber's copper wire counterparts can only transmit approximately 24 two-way conversations. Third, unlike its copper wire counterparts, fiber optic cables are generally free from outside electromagnetic interference such as that caused by industrial machinery or two-way radios. Finally, signal quality over fiber optic cables is generally not lost over long distances when large numbers of video, voice and data transmissions are carried simultaneously.

Despite these features, because fiber optic cable is usually buried under the ground, it is susceptible to accidental interruptions caused, for example, by digging into the cable. In addition, fiber optic cable may be expensive to install because of the physical effort required and the expense of acquiring easements and road crossings to bury the cable on public and private lands. Finally, the equipment needed to send and receive transmission signals across fiber optic cables may be expensive.

The actual costs of laying a fiber optic system may vary dramatically depending on several factors. Among those factors are: (1) the routes employed to set up the system; (2) whether those routes are currently used by other users; (3) the vendor selected to provide the fiber used; and (4) other design specifications. However, part of the cost of using fiber optics

may be mitigated for certain end users including certain schools, libraries, colleges and vocational schools as a result of commitments made by Ameritech Wisconsin during legislative action on the telecommunications bill enacted as 1993 Wisconsin Act 496. [See Part IV, D, of this Staff Brief.]

B. MICROWAVE TECHNOLOGY (INSTRUCTIONAL TELEVISION FIXED SERVICE)

Information may be transmitted by the use of microwave signals. Microwave transmissions use high-frequency radio waves to send signals through the air from one point to another point (point-to-point) or from one point to many points (multipoint or omnidirectional). Microwave signals usually can travel a maximum distance of about 40 miles.

Microwave transmissions are received by antennas employing parabolic, or curved, reflectors. A wave guide, which is a special type of transmission line, traps the radio signals in the antenna and directs them to a receiver which converts the microwave signal for use by the end recipients. Depending on the type of microwave system employed, standard receivers may cost as much as $25,000. Since one microwave antenna may receive many different transmissions from different senders, microwave technology may provide a relatively cost-effective means for many rural school districts to receive programs.

Microwave transmitters are more expensive than microwave receivers. Transmitters can range in price from $40,000 for a single channel transmitter/receiver combination, to more than $150,000 for a transmitter capable of transmitting 10 channels or more. Accordingly, using microwave technology for two-way communications will increase costs, perhaps substantially, for users.

Microwave is a "line of sight" technology. This means that for microwave signals to travel from the sender to their final destination, the path over which the signal travels must be relatively free of obstructions which may impede or block the microwave transmissions. A typical microwave system would utilize a series of tower mounted antennas, each receiving a signal from another similar tower located from five to 40 miles away. Terrain obstructions may usually be overcome through the use of relay stations, reflectors or other technologies. When constructing a microwave transmitting tower, terrain profiles are conducted to determine variations in ground elevation and to identify other obstructions which may block microwave transmissions from one point to the next.

Because microwave systems are sent over the air, easements are not needed as they may be for land-based transmissions such as fiber optics or coaxial cable. However, land acquisition may be required in order to erect the towers needed to send, receive and redirect microwave transmissions. In addition, the construction of a microwave tower may entail the acquisition of numerous local state and federal permits and other approvals.

Microwave transmissions are generally regulated by the Federal Communications Commission (FCC).

Instructional Television Fixed Service (ITFS) is an educational communications technology based on microwave technology. The ITFS signal is broadcast in all directions from an omnidirectional broadcast antenna. Because of this multidirectional broadcast feature, an ITFS broadcast may reach numerous locations in a cost-effective manner.

ITFS utilizes microwave frequencies that are specifically reserved by the FCC for use by educational institutions. ITFS employs low power and uses limited frequencies. Consequently, ITFS is more limited in its range than broadcast television described under Section E, below. In addition, much of Wisconsin's topography requires those wishing to receive ITFS signals to construct receiving towers to a height which may add substantial costs to the system.

A number of ITFS transmitting sites have been built in Wisconsin with an average cost of about $225,000 per location, while average receiving sites cost about $5,000 per site. Although many receiving sites can utilize roof-mounted antennas, transmitting sites often require local building permits, land acquisitions and various agency clearances, such as approval from the Federal Aviation Administration (FAA).

C. SATELLITE TECHNOLOGY

A satellite is a device which orbits the earth and is used to receive and transmit communications signals from the earth. It is composed in part of a multichannel repeater and transponder which receives, amplifies, reshapes and retimes communications signals and then retransmits the signals to downlinks (receivers) on earth. Satellites are often capable of receiving a number of video, data and voice signals from any number of uplinks (senders), which may be located anywhere from which the satellite is "visible" above the horizon. The downlinks and uplinks are often referred to as satellite dishes.

It is estimated that there is room for at least 30 satellites in the satellite belt above the earth which can be viewed continuously from North America. Currently, there are approximately 20 satellites in this satellite belt. Five or six of these satellites currently carry programming which may be of interest to educational institutions.

An advantage of using satellite broadcasts is that the retransmission of the signal from the satellite may be received by any number of downlinks over a relatively large territory without concern for geographical obstructions. Because of this feature and the relatively low cost of downlinks, satellite transmissions may be cost-effective for recipients of the signals. However, satellite transmissions may not be cost-effective for two-way transmissions because transmitting equipment is often expensive and, for two-way transmissions, each downlink in the system would require accompanying transmission equipment.

Satellite transmissions require FCC approval and licensing.

D. TELEPHONES

Wisconsin's existing telephone network provides another source of technology for educational communications. Most of the telephone technology currently available to educational users in Wisconsin is designed primarily for voice traffic. Expanded circuits which could handle communications such as video are not yet readily available in Wisconsin, although these expanded circuits are being planned and installed in some parts of the state.

Telephone carriers are regulated by both the FCC and the Wisconsin Public Service Commission (PSC).

E. BROADCAST TELEVISION AND FM RADIO

Broadcast television and FM radio are used to provide educational programming using broadcast frequencies which can be received by standard television and radio receivers. These systems typically consist of one-way transmissions, although public "call in shows" offer two-way access via the public telephone system. Current educational television and radio reach over 90% of Wisconsin's population.

Initial costs for television and radio broadcasting equipment is expensive. Maintenance of the broadcast facilities may also be expensive. In addition, broadcasters are subject to various federal regulations including FCC licensure and approval. However, due to their wide coverage areas and relatively low-cost receiving apparatus, broadcast television and radio may be very cost-effective to program recipients.

Although broadcast distance is usually greater than the distance of microwave transmissions, broadcast television and FM radio also suffer from range limitations. Currently, television and FM signals broadcast by Wisconsin Public Radio and Wisconsin Public Television (described in Part I, H, above) from Madison are distributed to receiving locations throughout the state through an interconnect system utilizing a microwave transmission system leased from MRC Telecommunications, Inc. In addition, low-power FM facilities (i.e., "LPFM" facilities) which use lower power than their full-power counterparts and use low antennas, relay standard FM broadcasts to areas that are hard to reach by standard FM. The service range of the typical LPFM station is restricted to approximately seven miles. LPFM stations require FCC approval and cost from between $40,000 to $100,000 to build.

F. CABLE TELEVISION AND COAXIAL CABLE

Cable television is a communications technology in which television programming, other than that which is broadcast over the air, is offered to paying customers. The primary mode of delivery for cable television is the coaxial cable. Coaxial cable is a cable with an insulated central conducting wire (typically copper) surrounded by several other wires. Although coaxial cable may carry large amounts of information, it has less capacity than fiber optic cable.

The use of local cable television systems for local and regional distance education purposes is already well-established at many locations throughout Wisconsin. Some communities and educational institutions have lease agreements for the provision of educational cable television and, in some communities, cable television service to the local schools is a condition of the cable company's municipal franchise agreement.

Cable programming may utilize either live performances or taped performances. Channel capacity varies on cable television systems throughout Wisconsin, ranging on the high end from the 100-channel system in Milwaukee to the typical 12-channel system in many communities elsewhere. One-way cable hookups can be very cost-effective for the program recipient. Two-way cable hookups, however, are usually more expensive than one-way transmissions due to more complex system design requirements and cost of the necessary transmitting equipment.

G. MAGNETIC MEDIA

The use by educational institutions of VCR tapes and similar technologies is another, albeit rather limited, use of educational communications technology. The cost of a VCR is low, as are the costs of blank VCR tapes for local taping. Prerecorded programming available in VCR format can be more expensive but is still relatively inexpensive with programs available for $10 to $1,000. This technology is currently readily available in most, if not all, educational settings in the state. This technology is inherently one-way.

H. CD ROM AND VIDEO DISKS

Like VCR technology, CD Rom's and video disks are essentially one-way communications technologies and are, accordingly, somewhat limited in their total educational utility. However, CD Rom and video disks provide more data storage and retrieval capabilities than VCR tapes. Accordingly, CD Rom's have found their greatest use in the library setting in the form of catalog storage and retrieval.

Like VCR technology, CD Rom and video disks technology is a low-cost educational tool with CD Rom and video disk players ranging in price from $1,000 to $1,500 and control computers costing from $2,000 to $5,000. The making of a disk may cost anywhere from $10 to $1,000 or more, depending upon the content of the disk and the number of copies made.

CD Rom's and video disks, unlike VCR tapes, are random access devices in that any frame containing information on a disk can be located quickly, without having to rewind or backtrack through an entire disk, as would have to be done with VCR tapes. While CD Rom's and video disks provide only one-way communication, their random access capabilities make the technologies suitable for instructional programming which changes or presents different fact situations based on students' answers.

I. THE INTERNET

The Internet is a telecommunications network developed in the late 1960's by the U.S. Defense Department. Its original design was to allow quick transmission of data between researchers engaged in defense-related projects and to test communications systems capable of surviving a nuclear attack. Since its inception, the Internet has expanded throughout the country and the rest of the world. According to some estimates, the Internet now connects over 20 million users through 17,500 separate networks in over 100 countries throughout the world.

The Internet is a decentralized network that uses communication protocol to transmit data. Users of the Internet are provided "addresses" which help ensure that data transmitted over the Internet reach their intended locations. Data are transmitted between network sites by high-speed telephone lines at a rate of up to and exceeding four million characters per second. The Internet allows users to communicate directly with each other and to obtain information that has been posted to the network on bulletin boards or is available in other data bases available to the network.

Source: DPI Publication: *The Internet, NREN and Current Networking Issues*, April 1994.

PART III

APPLIED COMMUNICATIONS TECHNOLOGIES IN WISCONSIN

A number of the communications technologies discussed in Part II of this Staff Brief are being offered to or used by Wisconsin schools and other educational institutions in a variety of ways. This Part of the Staff Brief summarizes a number of ways these technologies are being used in Wisconsin's educational institutions. Examples of planned applications are also described.

A. EXAMPLES OF EXISTING APPLICATIONS

1. Instructional Television

More than 100 kindergarten through grade 12 (K-12) instructional television series are broadcast during the school year on Wisconsin Public Television stations throughout the state. Electronic translators located at various points throughout the state ensure that instructional television coverage is available to most areas of the state. K-12 programming topics on Wisconsin Public Television include science, social studies, English, geography, language arts, health education, economics and foreign languages. In addition, various adult education programming is available throughout the week.

2. Educational Teleconference Network

The Educational Teleconference Network (ETN), which is operated by the UW-Extension, is the nation's oldest audioconferencing educational network. ETN is a two-way, dedicated audio network operated by the Instructional Communications Systems within the UW-Extension. During the 1992-93 school year, 22,878 people enrolled in ETN programming. Over 170 ETN sites are located in county extension offices, libraries, hospitals and UW institutions throughout the state.

ETN participants use special group audio teleconferencing equipment to listen to instructors and to ask questions or make comments. Instructors can speak to their students statewide from any ETN site or from any telephone anywhere in the world. ETN programming may be carried to the entire state or to only specific regions of the state.

Examples of programming offered through the ETN include college credit courses, faculty, staff and administrative meetings, government agency training programs and satellite videoconference discussion groups. ETN is available year-round to governmental, educational and nonprofit agencies. University of Wisconsin outreach departments using ETN are usually charged a user fee; other Wisconsin users are charged approximately $230 per hour.

Source: UW-Extension Publication: *Educational Teleconference Network*, July 1994; and *The University of Wisconsin System 1994-95 Fact Book*, page 36.

3. WisLine

WisLine is a teleconferencing service operated by the UW-Extension which can connect up to 68 telephone lines throughout the world at the same time. The system utilizes the State Telecommunications System (STS) long-distance rates and offers users a number of features such as operator assistance during conferences, the ability to split conferences into subconferences and reunite them, operator assisted roll calls to verify attendees and to announce late participants, the ability to play prerecorded tapes during a conference and the ability to tape conferences. Conferees have the option of dialing into WisLine to be connected to the conference, having the WisLine operators call them to be connected to the conference or dialing an 800 number to be placed in the conference.

Generally, charges for WisLine are based on the long-distance rates applicable to the various conferees. During the 1992-93 school year, 7,692 participants enrolled in WisLine conferences.

Source: UW-Extension Publication: *WisLine Teleconferencing Service*, undated; and *The University of Wisconsin System 1994-95 Fact Book*, page 36.

4. The Wisconsin Union Catalog

Developed by the Wisconsin Division for Library Services within the DPI (subsequently renamed the Division for Libraries and Community Learning), the Wisconsin Union Catalog (WISCAT) is a CD Rom-based card catalog containing over 4.7 million titles compiled from 1,057 contributing libraries throughout the state. WISCAT can be used to find the specific libraries which hold specific titles. Currently, WISCAT is distributed to over 700 Wisconsin libraries throughout the state. To use WISCAT, participating libraries must have access to an IBM-compatible microcomputer and four CD Rom disk drives as well as the appropriate software.

Source: Testimony of Robert Bocher, DPI Technology Consultant, to the Legislature's Joint Committee on Information Policy, April 19, 1994.

5. Learning Link

Operated by the ECB, Learning Link is an on-line computer system which offers various information services to Wisconsin's teachers. Learning Link may be accessed by teachers using a personal computer and a modem with the appropriate communications software. Each teacher who uses Learning Link must have a personal password to log into the system.

In addition to various discussion centers and bulletin boards, Learning Link offers a service called the Curriculum Connection which is a data base of about 1,500 programs available

from the instructional television series aired over Wisconsin Public Television. Curriculum Connection may be used to view program descriptions or search for programs on specific topics with key words.

Source: ECB Publication: *Parade of Programs: 1993-94.*

6. WisView Audiographics Teleconferencing

WisView is offered by the UW-Extension in cooperation with the UW-Madison Department of Engineering Professional Development and the UW Centers. WisView combines audio teleconferencing and computer-generated graphics. Voice, text and graphics are transmitted over standard telephone lines utilizing the WisLine teleconference facilities. The audio equipment needed for WisView includes an audio speaker and a push-to-talk microphone. The videographics equipment required for each site includes a computer and keyboard, an electronic pen-tablet combination, a color monitor and a modem. In addition, some WisView sites have a video camera, a document scanner and a printer.

WisView sites are located throughout the state at UW campuses and UW Centers. In addition, individual sites may be set up on a course-by-course basis.

Costs for using WisView include long-distance charges for two telephone lines to each site. During the 1992-93 school year, 582 participants enrolled in WisView conferences.

Source: UW-Extension publication: *WisView Audiographics Teleconferencing*, undated; and *The University of Wisconsin System 1994-95 Fact Book*, page 36.

7. Satellite Educational Resources Consortium

The Satellite Educational Resources Consortium (SERC) is a nationwide collaboration between various states' education departments, local school districts, educational television entities, other education-related institutions and private industry. Funded in part by various federal grants, SERC provides educational programming for high school students as well as teacher in-service and training programs to schools in various parts of the country via satellite broadcasts. In the 1993-94 school year, approximately 150 high school students in 30 school districts participated in SERC credit courses. In addition, approximately 100 school districts throughout Wisconsin participate in the over 130 hours of professional development programs offered by SERC.

Source: DPI Publication: *Examples of Distance Learning Systems in Wisconsin by Technology.*

8. ITFS Consortia

Wisconsin's ITFS technology, described in Part II, B, above, is being employed by numerous educational consortia throughout the state. These consortia currently include public school districts, individual public elementary and secondary schools, CESA's, TCS districts, UW System institutions and other institutions. Programming on these ITFS consortia projects include live two-way instruction, satellite telecourses, teleconferences and videotaped programming.

The ECB licenses a number of ITFS sites including those in the following areas: Chilton, Eau Claire, Green Bay, Green Lake County, Janesville, La Crosse, Madison, Milwaukee, Oconto Falls, Platteville, Rhinelander, Rice Lake, Sheboygan, Spencer, Stevens Point, Superior, Wausau and Cato. Examples of these consortia include the following:

a. Green Bay Area ITFS (Northeast Wisconsin Telecommunications Education Consortium)

The Northeast Wisconsin Telecommunications Education Consortium (NEWTEC) provides ITFS services to a number of Green Bay area schools, including elementary, middle and high schools. Programming on NEWTEC includes NEWTEC credit and noncredit courses (i.e., courses developed by NEWTEC), UW-Green Bay credit courses, UW-Oshkosh credit courses, Fox Valley Technical College credit and noncredit courses, satellite teleconferences and foreign language news.

b. Janesville ITFS (Green and Rock Area Distance Education Systems)

Green and Rock Area Distance Education Systems (GRADES) serves schools and other institutions located in Green and Rock Counties, including the Beloit School District, Blackhawk Technical College, Brodhead High School, Clinton High School, Edgerton High School, Juda High School, Milton High School, Monroe High School and Orfordville. Programming on GRADES includes various technical college courses, SERC courses, SERC teacher in-service, high school calculus from UW Center Rock County, in various satellite teleconferences.

c. La Crosse Area ITFS

The La Crosse Area ITFS serves numerous La Crosse elementary, middle and high schools and schools in Holmen, Onalaska and West Salem. Programming on the La Crosse Area ITFS includes Wisconsin Public Television instructional programs and La Crosse public school informational programs and department meetings.

d. Madison ITFS (Dane County Area ITFS Consortia)

The Dane County Area ITFS Consortia (DCAIN) serves public schools throughout Dane County, including schools in Belleville, DeForest, Madison, and other institutions, including the DPI, UW College of Engineering and the UW Hospital and Clinics. Programming over DCAIN includes UW School of Education credit and noncredit courses, UW Hospital and Clinics health

education courses, SERC student courses in Japanese, Russian, world geography, precalculus and Latin, SERC teacher in-service, technical college telecourses, satellite conferences and other programs.

e. Spencer Area ITFS (Central Wisconsin Educational Telecommunications Network)

The Central Wisconsin Educational Telecommunications Network (CWETN) serves schools including Granton High School, Loyal High School, Spencer High School, and D. C. Everest High School. Programming on the CWETN includes ACT-SAT college entrance testing and study skills, foreign language, calculus and college prep writing.

f. Stevens Point Area ITFS (Central Sands Narrowcast Consortium)

The Stevens Point Area ITFS is not yet in operation, but potential receiving sites for this service include schools in the Stevens Point area. These schools include public and private schools in Wisconsin Rapids, Stevens Point, Marshfield, Nekoosa and Pittsville. Also included as a potential receiving site is St. Joseph's Hospital in Marshfield. Programming over this system may include UW-Stevens Point undergraduate and graduate courses. Other courses are being planned by CESA 5.

g. Wausau Area ITFS (Wausau Area Narrowcast Users Consortium)

The Wausau Area ITFS serves Abbotsford High School, Antigo High School, D. C. Everest High School, Edgar High School, Gleason High School District, Good Samaritan Hospital, Homme Home for the Elderly, Lincoln Hills School, other Wausau area schools, Northcentral Technical College in Medford, Northcentral Technical College at Wausau, UW Center in Marathon County and the Wittenberg School District. Receivers also include UW-Stevens Point. Programming on the Wausau Area ITFS includes Northcentral Technical College credit and continuing education courses, SERC student courses and teacher in-service, staff meetings, UW-Stevens Point undergraduate and graduate credit courses, UW-Oshkosh Bachelor of Science nursing courses and CESA 9 staff development courses.

Source: ECB Document: *ECB Instructional Television Fixed Service (ITFS) Sites*, August 1, 1993.

9. Northern Wisconsin Educational Communications System

The Northern Wisconsin Educational Communications System (NWECS) serves educational institutions in the northern part of the state, including the Wisconsin Indianhead Technical College campuses in Ashland, New Richmond, Rice Lake, Shell Lake and Superior and CESA 12, UW-Superior, Ashland High School, Bayfield High School, Drummond High School, Southshore High School, Superior High School, Washburn High School, the Winter School District, the Melon School District and Lac Courte Oreilles Community College. At least 184 high school students are taking courses offered over NWECS in the fall semester of the 1994-95 school year.

The NWECS network transmits full motion, two-way video, voice and data communications over fiber optic lines that allow participating schools to engage in instructional programming as well as have access to other multimedia systems such as videotape libraries. NWECS offers advanced placement courses, foreign language, special education, programming for at-risk pupils, Native American studies, computer science programs, vocational courses, community education, adult education, undergraduate offerings for communities, graduate training for teachers and administrators and in-service opportunities along with a number of other services.

NWECS is governed by a seven-member board consisting of three permanent seats held by representatives of CESA 12, the Wisconsin Indianhead Technical College and the UW-Superior. Members in the four remaining seats are elected at large by system participants for staggered terms.

Costs to schools participating in NWECS include an annual fee of $26,500 per school for line charges and operational costs. In addition, each school is charged a fee of $200 for each student taking a course over NWECS. Approximately $155 of this fee is forwarded to the school originating the course and the remainder is for operational and administrative expenses of NWECS. Finally, each school must equip a studio at a cost of between $17,000 and $50,000, depending on the equipment used.

Source: NWECS Brochure: *Northern Wisconsin Educational Communications System*, undated; and telephone conversation with Ken Rogers, NWECS Administrator, September 12, 1994.

10. Embarrass River Valley Instructional Network Group

The Embarrass River Valley Instructional Network Group (ERVING) project, located in northeast Wisconsin, uses fiber optic technology to bring expanded class offerings to several small schools in its service area. The high schools served by ERVING include Bonduel, Bowler, Clintonville, Marion, Menominee Indian, Tigerton and Wittenberg-Birnamwood. Three hundred twenty high school students take classes over the ERVING network. ERVING offers its users two-way, full-motion video and audio transmission over leased fiber optic lines. The system allows any site within the ERVING project to originate programming for the network. The programming that ERVING offers includes foreign languages, advanced placement courses and high school courses in business, social studies, science, mathematics, English, agriculture and computer. In addition, other uses of the network include university courses and technical college courses as well as staff development programs, interdistrict meetings and general community education.

Typical classroom equipment for schools participating in the ERVING project includes seven to eight video monitors in each room, three video cameras in each room, one or two VCR's for taping and rebroadcasting programs, audiomixers, an instructor microphone system and a student microphone system. Original equipment costs for each room were approximately $25,000. Six of the seven schools involved in the ERVING project originate programming for

broadcast over the network. Soon the ERVING network will be joining one of the ITFS systems and will, accordingly, be able to offer programming offered by the ITFS system.

In addition to the initial expense for the technical equipment in each classroom, each district pays $603 per month for use of the telephone lines, $350 for each student participating in the program to cover instructional costs and $1,000 per month for administrative costs. The annual cost to each school is around $30,000 per year.

Source: Various informational brochures produced by ERVING; and telephone conversation with Susan Barry, ERVING Administrator, September 7, 1994.

11. South Central Instructional Network Group

The South Central Instructional Network Group (SCING) is a two-way, full-motion video and audio network utilizing fiber optic technology. SCING provides educational programming attended by about 190 students in high schools in Adams-Friendship, Portage, Pardeeville, Mauston, Randolph and Necedah. River Valley High School in Spring Green is expected to be brought on-line by January 1995. Also served is the CESA 5 office in Portage. Mid-State Technical College, Madison Area Technical College and Western Wisconsin Technical College provide community and other programming for the system.

Courses offered on the network include Asian studies, anatomy, business, history, psychology and advanced placement courses in English literature and calculus. Each participating school is expected to teach at least one course per year. Startup costs for studio equipment for each school were approximately $20,000 to $32,000. In addition, each school pays $1,950 per month for line charges for the system. Day-to-day administrative operations of the system are carried out by a coordinator who reports to the network's governing board which is comprised of the superintendent from each participating school.

Source: ECB Document: *Wisconsin Distance Education Network*, August 1994; and telephone conversation with Joan Spillner, SCING Director, September 7, 1994.

12. Project Circuit

Established in 1979, Project Circuit is a two-way, interactive video and audio cable system used to provide instruction to eight high schools in west central Wisconsin: Arcadia, Blair-Taylor, Eleva-Strum, Galesville-Ettrick-Trempealeau, Independence, Lincoln, Osseo-Fairchild and Whitehall. About 300 students in the eight schools receive instruction over the network.

Examples of courses offered by Project Circuit include foreign languages, business courses, college writing, psychology and advanced placement math. The system may also be used for staff development programs and occasional school meetings.

Each participating school can originate programming over the network. The network has one full-time director who does the planning and scheduling of network programming in conjunction with the superintendents and principals of the participating schools.

Startup costs for each school included an initial investment of at least $20,000 for the studio equipment. In addition, each school pays an annual maintenance fee of $10,000 for technical services provided by Western Wisconsin Communications Cooperative.

Source: ECB Publication: *Wisconsin Distance Education Networks*, August 1994; and telephone conversations with Sue Loomis, Director of Project Circuit, and Mark Schroeder of Western Wisconsin Communications Cooperative, September 1994.

13. Ameritech Superschools

Ameritech Wisconsin is providing grants totaling $2.2 million to five Wisconsin K-12 schools. The grants are being used to fund the costs of on-site computer and telecommunications equipment through the 1994-95 school year. The schools participating in the grant program are required to pay annual line and usage charges estimated at between $15,000 and $20,000.

The participating schools are the Appleton East High School, the Hi-Mount Elementary School in Milwaukee, the Washington High School in Milwaukee, the Watertown High School and the Waupaca High School.

The Superschool schools will be able to participate in the following:

a. Homework Hotline: Allows parents and students to have 24-hour access to recorded school information such as homework assignments and school lunch menus.

b. Home Learning Link: Allows students at home or in public libraries to have access to library and educational data bases, electronic bulletin boards and electronic mail services.

c. Desktop Videoconferencing: Allows two computer users to view information simultaneously on their respective screens and allows users to see each other on their respective computers with "picture-in-picture" capability.

d. Dynix Automated Library System: Allows school libraries access to the resources of other libraries, other data bases and information services through the use of a personal computer.

e. Video Distance Learning: Allows two-way, interactive videoconferencing between classrooms using fiber optic technology.

Source: Wisconsin Bell (Ameritech) press release: *Five Wisconsin Schools Receive $2.2 Million Technology Grant*, dated July 28, 1993.

14. Video Teleconferencing

The UW-Extension, UW-Milwaukee, DPI, Wisconsin TCS and the ECB are participating in a multimedia teleconferencing project originally funded as part of a 1993 Ameritech Wisconsin grant. The project employs videoteleconference technologies under various conditions.

The project uses dial-up, digital telephone lines (ISDN) to allow the simultaneous transmission of audio conference, audiographics and videoconference signals. The system will let users at each site connect with users at the other sites in the state in either point-to-point or multipoint fashion. They may also be connected to other public and private videoconferencing sites equipped with the appropriate equipment located anywhere in the world. A sample of the multimedia equipment at each site includes a camera, two 27-inch video monitors, microphones, control key pad, international standard coder/decorder (codec), audiographics computer, graphics tablet, scanner and audioconferencing equipment. Initial cost of this equipment is approximately $50,000.

Educational sites presently participating in this project are UW-Extension in Madison, the UW-Milwaukee Civic Center Campus in Milwaukee, Chippewa Valley Technical College in Eau Claire and the Appleton Public Library in Appleton, which is part of the Outagamie-Waupaca library system, UW-Platteville and UW-Stout. These multimedia teleconferencing sites are used in the educational setting for educational seminars for faculty and administrators and in-service training for faculty. In addition, a few credit courses between UW-Madison and UW-Eau Claire are being offered.

In addition to these sites, nine other videoconference locations have been established in various state and local government offices throughout the State of Wisconsin. The locations of these other sites are: UW Hospital and Clinics in Madison, Waupun Correctional Institution in Waupun, Lincoln Hills Juvenile Correctional Facility in Erma, Milwaukee Children's Court complex in Milwaukee, the DOA Administration Building in Madison, the Governor's Office in Madison, the state office buildings in Green Bay and Milwaukee and the UW-Eau Claire Office in Eau Claire.

Source: UW-Extension Document: *Compressed Digital Video*, undated.

B. EXAMPLES OF PLANNED APPLICATIONS

1. Jefferson/Dane Interactive Network

This planned network will include CESA 2 and the school districts of Cambridge, Deerfield, Fort Atkinson, Jefferson, Johnson Creek, Lake Mills, Marshall, Palmyra, Eagle, Sun Prairie, Waterloo, Watertown and Whitewater. In addition, Madison Area Technical College campuses at Truax, Fort Atkinson and Watertown will also be served. The network will offer two-way, full-motion video and audio and is exploring the use of either fiber optics or coaxial cable. This network is not expected to be operational until Fall 1996.

Source: ECB Document: *Wisconsin Distance Education Networks: Planned*, August 1994.

2. Wisconsin Overlay Network for Distance Education Resources

The Wisconsin Overlay Network for Distance Education Resources (WONDER) is a consortium of educational institutions located in the northwest and central part of the state. Using fiber optic technologies, schools within the WONDER consortium will have the ability to deliver full motion, two-way videoconferencing between all members. The WONDER consortium includes the following members: UW-Eau Claire, UW-La Crosse, UW-River Falls, UW-Stevens Point, UW-Stout, Chippewa Valley Technical College, Fox Valley Technical College, North Central Technical College and Western Wisconsin Technical College. The consortium has also been working closely with the DOA and the ECB.

It was expected that the first WONDER courses would be offered in the Fall of 1994. However, contract negotiations and a pending complaint filed with the PSC by AT&T may delay the startup of WONDER until at least the Spring of 1995. The DOA has been facilitating the leasing of the telecommunications system by negotiating a lease with the telecommunications vendor. Costs of operating and maintaining the system will be approximately $3,800 per month per school in addition to studio equipment costs of between $20,000 and $50,000 for each site.

The consortium has developed an organizational structure which will be managed by an operations board. Each member school will have one voting representative on the board. The North Central Technical College will serve as the consortium's management and fiscal agent. In addition, the consortium has developed a programming team, a technical team and a grants and funding team to consider issues such as scheduling, facility utilization, classroom and instructor standards and grant writing.

Source: UW-Extension Document: WONDER, June 8, 1994; and telephone conversation with Barbara Cummings, WONDER Administrator, September 9, 1994.

3. Wisconsin Community Information Partnership

The Wisconsin Community Information Partnership (WiCIP) is a project planned by the ECB, UW-Extension and other private organizations to develop community information networks throughout the State of Wisconsin. Dane and Grant Counties will serve as pilot sites for this program. Information to be shared on these information networks will be provided by educational institutions, government agencies, libraries, medical centers, community nonprofit agencies and other various community groups.

There will be six levels of accessibility to WiCIP. Each level will be available for public use 24 hours a day, seven days a week. Each level of accessibility will use some form of communications technology and will require the user to have certain equipment. While the goal of the program is to provide readily available information to all individuals, some of the higher

levels of accessibility may require small fees and other costs associated with using the program. The six levels of accessibility are described below.

a. Level 1: Telephone Accessibility

In Level 1, users will call a toll-free telephone number to listen to audio messages on various topics. Users will need a touch-tone telephone. It is intended that the person using the service will choose his or her message from a list of hundreds of available messages. Each audio message will be updated periodically so that the information is timely and accurate. To update a message, the provider of the information must simply call into the system, enter an access code and record the most current information to be made available.

b. Level 2: Fax Back

Level 2 utilizes fax machines that will automatically return requested information to the requester. Again, like the first level, the requester will choose from a list of many available topics. However, at this level, the user will need to have access to a fax machine (or a computer which can receive a fax).

c. Level 3: Electronic Bulletin Board

This level will require a user to acquire a computer and a telephone modem. The user may dial into an electronic bulletin board which will provide menus of available topics from which any topic may be selected. The user will have the option of reading the material while on-line or may download and print a file for later review. The program envisions making public access computers available at such places as libraries, government agencies, schools and other areas.

d. Level 4: E-Mail and Electronic Discussion Groups

The fourth level of the WiCIP will also require use of a computer and a modem, but before users can have access to this level, they must apply for and receive a password. Once they have received their password and have access to the system, they may access bulletin boards, post messages to individuals and receive electronic mail messages. This level will also have electronic forums moderated by community leaders or experts to which users may contribute information.

e. Level 5: Internet

Level 5, as with Levels 3 and 4, will require users to have access to a computer and a modem. Users will also need a password. In this level, users will have access to information located in data bases in other cities around the country and the world via computer networks such as the Internet. Use of this system may require the user to pay a fee to access the services of some of these computer networks.

f. Level 6: Video-, Audio- and Computer-Based Information

In the sixth level, users, who must have a personal computer and a modem, will have access to audio-, video- and computer-based information and educational opportunities in their homes, schools and businesses. Users will be able to participate in educational instruction from educational institutions in local communities and elsewhere. Again, because this level will provide access to various computer networks and educational and other organizations, users may be charged a fee.

WiCIP is expected to be implemented after January 1995.

Source: ECB and UW-Extension Document: *Wisconsin Community Information Partnership*, undated.

4. Western Wisconsin Rural Datafication Consortium

The Western Wisconsin Rural Datafication Consortium was formed in early 1994 in an effort to improve regional data communications in the La Crosse area. One of the major goals of the Consortium is to provide full Internet access to all users in the Consortium service area regardless of the user's economic status, geographic location, age or educational attainment.

The Consortium plans to serve users in the Counties of Buffalo, Jackson, Juneau, La Crosse, Monroe and Trempealeau and the La Crescent-Hokah School District in Southeastern Minnesota. A partial list of members in the Consortium include: UW-La Crosse, Century Telephone Company, CESA 4, Franciscan Health System, Gunderson Clinic, La Crescent-Hokah School District, La Crosse Chamber of Commerce, La Crosse Public Library, UW Extension Viterbo College, Western Wisconsin Technical College and a number of La Crosse-area school districts.

The Consortium estimates its original two-year startup and operational costs will be approximately $87,680. To meet its financial needs, the Consortium plans to fund the program primarily through a combination of modest user fees and private donations. At present, the Consortium is seeking funding for the needed startup equipment to operate the system.

Source: Western Wisconsin Rural Datafication Consortium Material: *Western Wisconsin Internet Access Plan Project Description*, undated; and *Western Wisconsin Internet Access Plan Budget Needs*, undated.

PART IV

WISCONSIN'S RECENTLY ENACTED TELECOMMUNICATIONS LAW (1993 WISCONSIN ACT 496)

This Part of the Staff Brief describes portions of 1993 Wisconsin Act 496*, relating to telecommunications and the regulation of telecommunications utilities. Specifically, this Part describes portions of the Act which appear relevant to the development and use of educational communications technology. Generally, Act 496 takes effect on September 1, 1994.

Act 496 was developed to implement five recommendations of the Wisconsin Governor's Blue Ribbon Task Force on Telecommunications Infrastructure which met between May 1993 and November 1993.

A. TELECOMMUNICATIONS PROVIDERS AFFECTED BY THE ACT

In reviewing the provisions of Act 496 that appear relevant to educational communications technology, it is useful to understand the Act's use of the following terms:

1. ***Telecommunications provider:*** Any person which provides telecommunications services [s. 196.01 (8p), Stats., as created by Act 496].

2. ***Telecommunications utility:*** Any person which owns, operates, manages or controls any plant or equipment used to furnish telecommunications services within the state directly or indirectly to the public [s. 196.01 (10), Stats., as amended by Act 496]. These providers are commonly called ***local exchange telecommunications utilities***. Services provided by these utilities include basic local telephone services to residences and businesses and connecting these customers through "access services" to the services of other telecommunications providers, such as long-distance services provided by telecommunications carriers.

3. ***Telecommunications carrier:*** Any person which owns, operates, manages or controls any plant or equipment used to furnish telecommunications services in this state directly or indirectly to the public but does not provide basic residential access and use service (except on a resale basis) [s. 196.01 (8m), Stats., as amended by Act 496]. The only telecommunications carriers, as defined under the Act, currently operating in Wisconsin are AT&T Communications of Wisconsin, MCI and Sprint. Under Act 496, telecommunications carriers are specifically excluded from the definition of a telecommunications utility and, in general, are exempt from regulation by the PSC.

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* Some provisions of Act 496 may be preempted or otherwise affected by bills currently pending before the U.S. Congress. Those bills are very briefly mentioned in Part V, C, of this Staff Brief. As stated in Part V, C, additional information will be provided to the Special Committee on the relevant provisions of any of these bills that are enacted into law.

B. COMPETITION

Currently, the Public Service Commission (PSC) regulates various types of telecommunications utilities differently depending upon the competition to which they are subject. Act 496 establishes a new regulatory model for telecommunications utilities to manage the transition from a marketplace where telecommunications services are provided only by utilities to a marketplace where other persons also provide such services. The Act significantly reduces state regulation of telecommunications utilities, especially those utilities that provide local services, i.e., local exchange telecommunications utilities such as Ameritech Wisconsin and GTE North.

Act 496 is intended to facilitate increased competition among telecommunications providers and remove barriers to the development of an enhanced telecommunications infrastructure throughout the state. The Act also includes provisions that attempt to assure that all Wisconsin residents continue to have access to affordable, high-quality telecommunications services. Among the objectives of supporters of the deregulation and increased competition provided or contemplated by Act 496 is the promotion of the deployment of telecommunications infrastructure, the promotion of "universal service" and the promotion of increased choices for consumers, including schools and other consumers using telecommunications for educational purposes.

C. PRICE REGULATION

Traditionally, the procedure used to regulate utilities which have no or minimal competition has been a rate-of-return mechanism under which the regulatory authority determines the return on investment in excess of operating costs which will be authorized for a specific utility.

Act 496 authorizes a ***local exchange telecommunications utility*** to elect to become a "price-regulated telecommunications utility" in which the focus of regulation shifts from the utility's rate-of-return on investment to limits on the prices charged by the utility.* Under the Act, if a local exchange telecommunications utility makes such an election, then the following statutory limitations apply:

1. ***Three-year freeze on local service rates:*** In general, the utility's rates for basic local exchange service (basic residential access and use) and its rates for basic local small business service (standard access lines and usage by small businesses with no more than three access lines, e.g., phone lines) will be frozen for the first three years after it makes the election. If a utility with more than 500,000 access lines (i.e., Ameritech Wisconsin), elects to become price-

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* At public hearings held by standing committees of the Legislature on the bills that became Act 496, representatives of Ameritech Wisconsin and GTE North expressed interest in becoming price-regulated utilities (on September 1, 1994, Ameritech Wisconsin filed its election to be price-regulated); representatives of smaller utilities were less interested or noncommittal. In response to concerns of the smaller utilities, under the Act, in lieu of the price regulations described in this section and the investment commitment requirements described under Section D, below, a telecommunications utility with 150,000 or less access lines (i.e., a utility other than Ameritech Wisconsin or GTE North) may file a company-specific price regulation and investment plan with the PSC. The plan is subject to approval by the PSC [s. 196.196 (4) (b), Stats., as created by Act 496].

regulated, it must reduce its fixed, base rates for these residential services and for single-line business services by 10% for the three-year period.

2. ***Subsequent increases in local service rates; long-distance rates:*** Increases in the utility's rates for basic message telecommunications service (long distance between local exchanges in this state) and, after the three-year period described above, any increases in its basic residential and local small business rates are capped according to a formula specified in the statutes. Alternatively, the utility may alter these rates but the changes may be reviewed and approved, modified or rejected by the PSC [s. 196.196 (1) , Stats., as created by Act 496].

Under Act 496, the PSC has no jurisdiction over the prices for services offered by price-regulated utilities, except as specifically provided in the Act. Thus, if a local exchange telecommunications utility elects to become price regulated under the statutory provisions described above: (1) the prices it charges a ***school or other educational or public institution*** for basic access and usage services will be capped or regulated, as described above, ***only*** if the school or other institution has ***no more than three access lines***; and (2) the only other rates charged the school or other institution by the utility that will be capped or regulated by the PSC are rates for basic long-distance calls between local exchanges in this state [s. 196.196 (3), Stats., as created by Act 496].

D. INVESTMENT COMMITMENTS BY PRICE-REGULATED UTILITIES

Act 496 requires that, within 60 days after a telecommunications utility elects to become price-regulated under the statutory provision described above, the utility must file with the PSC a plan outlining its commitment to invest in telecommunications infrastructure improvements in the state over a period of not less than six years. A number of requirements relating to the investment commitment plan emphasize the use of the telecommunications infrastructure for educational purposes.

The utility's investment commitment plan must include all of the following:

1. A description of the level of planned investment in technological or infrastructure enhancements.

2. A description of the extent to which the planned investment will make new telecommunications technologies available to consumers or expand the availability of current technology.

3. A description of the planned deployment of fiber optic facilities or broad-band capabilities to schools, libraries, technical colleges, hospitals and colleges and universities in this state.

4. Target dates for the deployment of the planned technology and infrastructure improvements.

5. The level of planned contributions to the Wisconsin Advanced Telecommunications Foundation, described under Section F, below.

6. For Ameritech Wisconsin, a level of planned investment of at least $700 million within the first five years of the plan [s. 196.196 (5) (a) and (b), Stats., as created by Act 496].

In his written summary, *Highlights of Testimony by Bronson J. Haase, President, Ameritech Wisconsin, Before the Joint Committee on Information Policy on March 11, 1993*, Mr. Haase stated that:

> Ameritech and other telecommunications companies want to invest in this advanced network and Information Highway for Wisconsin. Now, there are barriers to that investment, but passage of this Bill means that Ameritech will invest about $700 million over the next five years in upgrading its Wisconsin network. That's more than $10 million a month, and that's a solid shot in the arm to the state's economy. This investment will bring a lot of good things, including the installation of ***fiber optics to the doorstep of more than 460 schools, libraries, colleges and vocational schools*** throughout the state (emphasis added).

In a subsequent press release, dated September 1, 1994, Ameritech Wisconsin indicated that this commitment applied to "some 460 ***middle and high schools***, colleges, universities, vocational schools, ***hospitals and major public libraries*** throughout Ameritech's state operating territory" (emphasis added). The press release also stated that the spending plan would detail a timetable for deployment of these fiber optic lines by the end of 1998.

A price-regulated utility must file an annual progress report on its investment in and deployment of infrastructure enhancements with the PSC. The report must include data on the telecommunications utility's operating and financial performance during the relevant period. The PSC must consider the telecommunications utility's progress in meeting the infrastructure commitments contained in its investment plan when making certain penalty or incentive adjustments to the prices the utility may charge for services subject to price regulation [s. 196.196 (5) (c), as created by Act 496].

The PSC may also make certain adjustments in the rates charged by the utility for price-regulated services if the PSC finds, after a hearing, that the utility did not file the required progress reports; that the utility filed a report that did not contain sufficient information to permit the PSC to adequately monitor the utility's investment in and deployment of infrastructure described in the investment plan; or that the the actual or planned investment described in the progress report did not adequately provide for deployment of advanced infrastructure technologies, fails to exceed routine facility upgrades necessary to maintain service quality or fails to meet the goals identified in the investment plan [s. 196.196 (5) (e), Stats., as created by Act 496].

Before January 1, 1996, and biennially thereafter, the PSC must submit a report to the Joint Committee on Information Policy on the status of investments in advanced telecommunications infrastructure in this state. The report must include information on the progress made in the following areas:

1. Distance learning, including the number of schools and other educational institutions connected to distance learning networks.

2. Interconnection of libraries, including the number of libraries with video conference and network access capabilities.

3. Access to health care.

4. Education, health care and employment opportunities for the disabled and other persons in the home.

5. Integrated services digital network deployment.

6. Other infrastructure investments identified by the PSC [s. 196.196 (5) (f) 1, Stats., as created by Act 496].

The PSC must include, in these reports, recommendations for improving the progress of investments in advanced telecommunications infrastructure. The PSC may combine this report with its annual report on the operation of the Universal Service Fund, described under Section E, below [s. 196.196 (5) (f) 2 and 3, Stats., as created by Act 496].

E. UNIVERSAL SERVICE FUND

Act 496 creates the Universal Service Fund which must be used, in part, to provide affordable telecommunications access to high quality education and library services. In general, the PSC must require all ***telecommunications providers*** to contribute to the Universal Service Fund ***beginning on January 1, 1996*** (thus, moneys will not be available from the Fund until sometime after that date). Contributions to the Fund must be based on the gross operating revenues for the provision of any intrastate telecommunications services. The PSC is required to designate, by rule, the classes of providers subject to the contribution requirements and establish the rates of contribution for each class of providers. The PSC would not directly administer the Fund but must contract for its administration [s. 196.218 (2) and (3), Stats., as created by Act 496].

The PSC must require that moneys in the Universal Service Fund be used only for the following purposes:

1. To assist customers located in areas of the state that have relatively high costs of telecommunications services, low-income customers and disabled customers in obtaining affordable access to a basic set of "essential telecommunications services."

2. To assist in the deployment of "advanced service capabilities" of a modern telecommunications infrastructure throughout the state.

3. To promote affordable access throughout this state to ***high-quality education, library*** and health care information services.

4. To administer the Universal Service Fund [s. 196.218 (5), Stats., as created by Act 496].

Act 496 does not, generally, enumerate the services that constitute "universal" services. Instead, under the Act, before January 1, 1996, and biennially thereafter, the PSC must promulgate rules that define:

1. A basic set of "essential telecommunications services" that shall be available to all customers at affordable prices and that are a necessary component of universal services. The Act states that essential services include single-party service with touch-tone capability, line quality capable of carrying facsimile and data transmissions, equal access, emergency service number capability, a statewide telecommunications relay service and blocking of long-distance toll service.

2. A set of "advanced service capabilities" that shall be available to all areas of the state at affordable prices within a reasonable time and that are a necessary component of universal service. For this purpose, a "reasonable time" shall be no later than January 1, 2005 and for rules promulgated thereafter relating to additional advanced service capabilities, no later than seven years after the effective date of the rules [s. 196.218 (4), Stats., as created by Act 496].

The Act requires the PSC to appoint the Universal Service Fund Council, consisting of consumers of telecommunications services (including the state) who must be the majority of the council and representatives of telecommunications providers. The Council is to advise the PSC concerning the administration of the Universal Service Fund [s. 196.218 (6), Stats., as created by Act 496].

Annually, the PSC must submit a Universal Service Fund report to the Legislature's Joint Committee on Information Policy. The report must include information about all of the following:

1. The affordability of and accessibility to a basic set of essential telecommunications services and of advanced service capabilities throughout the state.

2. The affordability of and accessibility to high-quality education, library and health care information services.

3. Financial assistance provided under the Universal Service Fund.

4. An assessment of how successful investments assisted by the Universal Service Fund or the Wisconsin Advanced Telecommunications Foundation (described under Section F, below)

and price regulation and other alternative incentive regulations of telecommunications utilities designed to promote competition have been in advancing the public interest goals identified under the Act; and recommendations for further advancing those goals [s. 196.218 (5r), Stats., as created by Act 496].

F. WISCONSIN ADVANCED TELECOMMUNICATIONS FOUNDATION

Under Act 496, the Governor is authorized to provide for the participation of the state in the formation and operation of the Wisconsin Advanced Telecommunications Foundation if certain organizational and operational conditions relating to the characteristics of the body are satisfied, including: (1) that the Foundation is organized as a nonprofit, nonstock corporation with the participation of the state and at least five telecommunications providers who operate in this state; and (2) that the Governor is authorized to appoint, with the advise and consent of the Senate, a majority of the directors of the Foundation [s. 14.28 (2) (a) to (f), Stats., as created by Act 496].

Act 496 provides for the creation of two funds to be administered by the Foundation: (1) the Endowment Fund; and (2) the Fast Start Fund. As described below, in making grants from these funds, the Foundation must give priority to local units of government, ***educational institutions and libraries***.

1. The Endowment Fund

The Foundation must create an Endowment Fund and establish a business plan that anticipates capitalizing the Fund with ***$25.5 million*** received from the state and telecommunications providers within ***seven years*** after the Foundation is organized. Act 496 appropriates to the Endowment Fund $500,000 general purpose revenue (GPR) in fiscal year 1994-95. This one-time appropriation sunsets on June 30, 1995. Funds from this appropriation may not be released without the approval of the Joint Committee on Finance. That Committee may not release the funds until it determines that the Foundation has received direct contributions from sources other than the state totaling at least $1 million [ss. 14.28 (2) (h) and (4) and 20.855 (4) (b), Stats., as created by Act 496].

2. The Fast Start Fund

The Foundation must also establish a ***$5 million*** Fast Start Fund which will be immediately available to support grants for the same purposes as those awarded from the Endowment Fund. Telecommunications providers must contribute $2 million in direct or in-kind contributions to the Fast Start Fund before January 1, 1996 and $3 million, at least 50% of which must be in direct contributions, before January 1, 1997 [s. 14.28 (6), Stats., as created by Act 496].

3. Additional Contributions

In addition to the contributions from telecommunications providers and the state, before January 1, 2002, the Foundation is required to attempt to raise from other persons a total of at least ***$10 million*** in direct or in-kind contributions for either the Endowment Fund or the Fast Start Fund [s. 14.28 (7), Stats., as created by Act 496].

4. Grants

Grants from the Endowment Fund or the Fast Start Fund may be made to the state; a local unit of government; an educational institution, library or health care information service located in the state; a public, educational or governmental (PEG) access facility, as defined by federal law (also known as a cable community television center); or any other person located in the state. In making a grant, the Foundation must give ***priority*** to applications from ***local units of government, educational institutions and libraries*** and must give additional priority to funding applications received from ***school districts*** in which the allowable percentage increase in revenue, or the allowable revenue per pupil, under the school district's revenue limit is less than the statewide average. The Foundation is also required to consider the financial resources available to the applicant. A funded project must require a matching contribution at a level set by the Foundation [s. 14.28 (3) (b) and (c), Stats., as created by Act 496].

A project that does any of the following may be funded by the Endowment Fund:

a. Establishes a clearinghouse that matches potential projects that are consistent with the purposes of the Foundation with interested funding sources.

b. Demonstrates cooperative applications between telecommunications users or between telecommunications users and telecommunications providers, if the project is replicable, serves to impart knowledge or skills or meets a demonstrated need and does not compete with the private sector in the deployment of telecommunications infrastructure.

c. Promotes the effective use of the telecommunications infrastructure.

d. Educates telecommunications users about advanced telecommunications technologies, applications and alternatives and associated effects on privacy.

e. Develops systems or procedures that assist individuals in applying information, produced through the application of advanced telecommunications and other information technologies, to create knowledge.

G. DEPARTMENT OF ADMINISTRATION MASTER LEASES

Act 496 modifies the existing master lease powers of the DOA. Prior to the enactment of Act 496, the DOA, on behalf of one or more state agencies, could enter into "master lease" agreements to provide for the lease/purchase of goods at the best interest rate obtainable by the

DOA. The DOA or another state agency was required to agree, under the master lease agreement, to become the owner of the leased goods upon completion of the lease agreement and the DOA was required to grant the lessor a security interest in the leased goods [s. 16.74 (4) (a) and (e), 1991-92 Stats.].

Act 496 authorizes the DOA to enter into master leases for the provision of services, as well as goods. In addition, the master lease agreements must provide for a schedule of periodic payments. Act 496 eliminates the requirement that a state agency become the owner of any goods leased under a master lease. In addition, the DOA is permitted, but not required, to grant a lessor a security interest in any goods leased under the master agreement.

As passed by the Legislature, Enrolled June 1994 Special Session Bill 2 (which was signed into law as Act 496) limited the types of services which the DOA could obtain through a master lease to "telecommunications services." However, the Governor exercised his partial veto authority to delete the word "telecommunication." As a result, master leases may be used for the procurement of any type of service.

The Governor indicated in his veto message that his action was taken to enable the financing of distance education services. He said that he believed the Legislature used the word "telecommunications" with the intent of limiting such additional authority to the provision of services for distance education. His objection was that the term "telecommunications services," as defined elsewhere in the Bill, might be construed to exclude activities needed to carryout distance education programs. The Governor stated that he would support legislation which would define the term "telecommunications services" for the purposes of the master lease statute.

Source: Veto message to Members of the Assembly from Governor Tommy G. Thompson, dated July 5, 1994.

PART V

FEDERAL FUNDING AND TELECOMMUNICATIONS REGULATION PROPOSALS

This Part describes certain federal funds available for educational communications technology and portions of proposals currently pending before Congress relating to educational communications technology.

A. GOALS 2000: EDUCATE AMERICA ACT

The new *GOALS 2000: Educate America Act*, P. L. 103-227, offers states federal grants to develop and implement "world class" educational standards and strategies to help students meet those standards. Two provisions of the Act deal specifically with the use of technology in schools.

1. Office of Educational Technology

The *GOALS 2000: Educate America Act* creates the Office of Educational Technology in the U.S. Department of Education. The Office is directed to write a national long-range technology plan. Among other things, the plan must explain how the Office will work with other federal agencies to promote advanced technologies in America's elementary and secondary school classrooms; outline how the U.S. Department of Education will collaborate with teachers, business leaders and others to facilitate the effective use of technology in education; and set long-range goals [P.L. 103-227, Title II, Part C].

2. State Plans

A state applying for a grant under the *GOALS 2000: Educate America Act* may, in its application, request a grant to develop or continue the development of a systemic statewide plan to increase the use of state-of-the-art technologies that enhance elementary and secondary student learning and staff development in support of the National Education Goals (set forth in the Act) and state content and student performance standards (to be formulated by a state improvement panel required of states receiving funds under the Act). Each state educational agency whose grant application is approved shall receive a grant of at least $75,000 to develop and, if the secretary has approved the state's systemic statewide plan, to implement its technology plan. The state's technology plan must have as its objectives:

a. The promotion of higher student achievement through the use of technology in education.

b. The participation of all schools and school districts in the state, especially those schools and districts with a high percentage or number of disadvantaged students.

c. The development and implementation of a cost-effective, high-speed, statewide, interoperative, wide-area-communication educational technology support system for elementary and secondary schools within the state, particularly for schools in rural areas.

d. The promotion of shared usage of equipment, facilities and other technology resources by adult learners during afterschool hours.

A state task force (separate from the state improvement panel mentioned above) must write a technology plan that identifies, describes or provides for all of the following:

a. The requirements for introducing state-of-the-art technologies into classrooms and school libraries in order to enhance educational curricula, including the installation and ongoing maintenance of basic connections, hardware and the necessary support materials.

b. How the application of advanced technologies in the schools will enhance student learning, provide greater access to individualized instruction, promote the standards and strategies described elsewhere in the Act and help make progress toward the achievement of the National Education Goals.

c. How ongoing training of educational personnel will be provided.

d. The resources necessary and procedures for providing ongoing technical assistance to carry out the plan.

e. Statewide dissemination of exemplary programs and practices relating to the use of technology in education.

f. A funding estimate and a schedule for the development and implementation of the plan.

g. How the state education agency will assess the impact of implementing the plan on student achievement and aggregate achievement for schools.

h. How the state and local educational agencies will coordinate and cooperate with business and industry and with public and private telecommunications utilities.

i. How the state educational agency will promote the purchase of equipment by local educational agencies that, when placed in the schools, will meet the highest possible level of interoperability and open system design.

j. How the state educational agency will consider using existing telecommunications infrastructure and technology resources.

k. How the state educational agency will apply the uses of technology to meet the needs of children from low-income families.

l. The process through which the plan will be reviewed and updated periodically.

m. How the state educational agency will facilitate collaboration between state literacy resources centers, local educational agencies and adult and family literacy providers to ensure that technology can be used by adult and family literacy providers during after school hours.

The task force that develops the technology plan must include experts in the educational use of technology and representatives of the state improvement panel required under the Act. The plan must be integrated into the state improvement plan and must be developed in collaboration with the Governor, representatives of the State Legislature, the State Board of Education (presumably, in Wisconsin, the State Superintendent of Public Instruction), institutions of higher education, appropriate state agencies, local educational agencies, public and private telecommunications entities, parents, public and school libraries, students, adult literacy providers and leaders in the field of technology, through a process of "statewide grassroots outreach" to local educational agencies and schools in the state.

Each state educational agency receiving a technology grant must submit a report to the U.S. Secretary of Education within one year of the submission of its systemic statewide plan. The report must describe the state's progress toward implementation of the plan; any revisions to the state's long-range plans for technology; and the extent to which resources provided pursuant to the plan are distributed among schools to promote the standards and strategies described in the state's improvement plan [P.L. 103-227, SEC. 317].

B. NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION GRANT PROGRAM

The National Telecommunications and Information Administration of the U.S. Department of Commerce has instituted a competitive grant program to "advance the goals of the National Information Infrastructure (NII) initiative." Grants are to be awarded to support those projects which most effectively:

1. Enhance the delivery of social services, such as education and health care; and

2. Support the formation of advanced nationwide, telecommunications and information infrastructure incorporating the widest variety of information technologies.

Congress appropriated $26 million for infrastructure grants in federal fiscal year 1994 (which ends in October 1994). The amount available for federal fiscal year 1995 is not yet certain but may range from $50 to $70 million. Grants are available, under this program, for demonstration projects and for planning.

Source: U.S. Department of Commerce, National Telecommunications and Information Administration, *Telecommunications and Information Infrastructure Assistance Program Guidelines for Preparing Applications, Fiscal Year 1994*; and information provided by DOA staff.

In Wisconsin, the DOA coordinated the submission of a single planning grant application on behalf of multiple state agencies. The estimated funding for the Wisconsin project, for the time period from January 1, 1995 through December 31, 1995, is $745,575. Of this amount, $331,990 would be provided by the state ($354,913 in cash contributions and $58,672 through in-kind contributions). The remaining $331,990 is the requested federal grant amount.

According to the "Project Narrative" to the Wisconsin grant application:

> [t]his project will allow Wisconsin to integrate state and community planning efforts toward the goal of extending an advanced telecommunications infrastructure to the "last mile." Until now, state-level and various community- and regional-level plans and networks have been fragmented and incomplete, with state efforts becoming more sophisticated but not extending to or interconnecting local communities. *Yet it is the ability of local communities to **use** the communications-based services that will drive the last mile extension of advanced telecommunications infrastructure.* The efficient connection of users to the National Information Infrastructure requires a coherent planning strategy to fill the gap between the state, community and individual users (emphasis in original).

According to the "Project Narrative," various state and local agencies would be involved in the project, including UW-Extension and the Department of Natural Resources (which would lead "rural datafication" and video town-hall planning activities) and the Department of Corrections and the TCS (which would be involved in interagency and cross-jurisdictional efforts to link the state's correctional institutions to higher education, county courts and community family visiting centers). Local agencies would also be involved to develop "user access tools."

According to the "Project Narrative," the Project will create the following "urgently-needed but never before possible results":

1. A comprehensive set of replicable models for community and regional organization, local infrastructure development and connectivity.

2. State-level network infrastructure recommendations for incorporation into the state's immediate procurement plans.

3. Shared tools for delivery of information to users statewide and for transactions between citizens and government.

4. A set of network development priorities and timetables with funding recommendations for state telecommunications investments at the local level and for partnership development with private sector vendors.

It is not yet known whether Wisconsin will receive a grant under this program. If it does, the grant will be coordinated by the DOA's Bureau of Information and Telecommunications Management (BITM).

C. FEDERAL TELECOMMUNICATIONS BILLS

Two bills introduced in the U.S. House of Representatives (HR 3626 and HR 3636) and one bill introduced in the U.S. Senate (S 1822) would substantially revise the regulation of the telecommunications industry. The two House bills have passed the U.S. House of Representatives. It is expected that a conference committee on the bills may be convened later this year if the Senate passes a similar bill.

Provisions of these bills which may affect educational communications technology in Wisconsin include: (1) a proposal for preferential rates for certain entities in small markets, including schools and public libraries (S 1822); and (2) a proposal to require the FCC to promote the development of advanced telecommunications services to such entities (HR 3636). Additional information will be provided to the Special Committee on the relevant provisions of any of these bills that are enacted into law.

JRH:RJC:all:las;wu;jt